

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

FLOODWAY

(ft)

CODE 404

DEFINITION

A channel, usually bounded by dikes, used to carry flood flows.

PURPOSES

This practice may be applied as part of a resource management system to support one or more of the following purposes:

- To carry floodwater from a side drainage across a flood plain into the channel of a main stream.
- To carry floodwater along the course of a main stream where, by means of dikes, part of the flood plain is used to and the rest is protected.

CONDITIONS WHERE PRACTICE APPLIES

All sites where existing channels of overflow areas of streams or rivers are inadequate to carry the floodwaters without flooding and damaging property, and the design storm discharge can be confined between dikes or a combination of channel and dikes without causing excessive erosion.

All sites where the storm runoff from side tributaries that will be ponded outside the floodway will not cause damages in excess of the benefits less the cost of the project.

The floodway standard does not apply to Floodwater Diversions (400) that divert water

from lowlands. A floodwater diversion can empty into a floodway. The floodway standard does not apply to channel improvement where the spoil is set back from the excavated areas and where no provision is made to confine the floodwater to the channel side of the spoil.

An outlet for the floodway must be available to provide for the floodway design discharge without creating stage increases in the outlet that could result in damages above or below the point of discharge that might involve legal actions under state laws.

CRITERIA

General Criteria applicable To All Purposes

Classification

Floodways that include dikes as a major feature of the floodway project shall use the same classification that is used for dikes. The classes are defined in the standard for Dikes (356).

Class I floodways either include Class I dikes as a feature of the floodway or are constructed to protect areas where either of the following conditions apply:

- a. There is a possibility of loss of life should dike failure occur.
- b. High-value land or improvements are to be protected.

Class II floodways either include Class II dikes as a feature of the floodway or are constructed to protect agricultural lands of medium to high

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capability; improvements are generally limited to farmsteads and allied farm facilities.

Class III floodways either include Class III dikes as a feature of the floodway or are constructed to protect agricultural lands of relatively low capability or improvements of relatively low value.

Design

The design and installation of a floodway and each of its features shall be based on engineering surveys and investigations that shall be made as recommended in applicable sections of the NRCS National Engineering Handbook and in TR-25, "Planning and Design of Open Channels". Rates of flow resulting from runoff from the storm against which protection is to be provided and the design for stability of the channel included in the floodway shall be determined from and based on these investigations. Criteria for channel stability, velocity, and coefficient of roughness contained in the standard for Open Channels (582) shall be followed.

Proportioning of the width and depth of flow in the floodway shall be based on consideration of the area to be occupied by the floodway with respect to the area to be protected, requirements for entrance of side drainage into the floodway, stage of water in the outlet for the design storm, velocities in the floodway at design flow and requirements for stability of the channel and dikes, and the effect on the water surface profile upstream from the floodway.

In designing a floodway, the effect of future upstream floodway construction that will increase the peak rate of flow should be considered. Provisions for future enlargement of the floodway to take care of this increase may be warranted.

From an economic standpoint, the best design for a floodway, including channel improvement and the correct proportioning of the width of the floodway and the height of dikes, results in a minimum cost for the dikes, channel improvements, and the value of the unprotected land in the floodway. The value of the unprotected land for this analysis would be

the difference in its value if it could be protected and its value for floodway purposes.

Floodways that include dikes as a part or feature of the project shall meet the same NRCS criteria established for that class of dike.

Class I floodways. Class I floodways shall be designed to provide maximum feasible protection. For urban protection as one of the primary objectives of a project or segment thereof, the project shall be planned to keep water out of the main part of the urban area during the largest flood of record. Such protection shall be no less than the 100-year-frequency level.

Class II floodways. If dikes are not included in Class II floodways, the floodway shall have the capacity to carry the peak runoff from a 10-year-frequency storm as a minimum.

Class III floodways. If dikes are not included in Class III floodways, the floodway shall have the capacity to carry the design flow selected on the basis of a study of site conditions.

Pipes

Floodway side slopes shall be protected from scour at pipe intake and discharge locations by appropriate measures. A pump discharge pipe exiting through the side of the floodway shall be installed above design high water, if feasible.

Slope Protection

The side slopes of floodways shall be protected from erosion. Types of erosion to consider when designing protection are sheet, rill, and gully erosion from rainfall; slope erosion from flowing floodwaters; and wave erosion. To provide erosion protection, measures such as vegetation, berms, rock riprap, sand-gravel, soil cement, or special vegetation may be needed.

State Requirements

Floodways shall meet the requirements of state laws or regulations.

CONSIDERATIONS

Range of Standard

This standard includes a full range of floodways. Extreme care and good engineering judgement is needed in establishing the floodway class and in recognizing that the design criteria are minimum values.

Location

When locating the floodway, consider the foundation soils, property lines, setbacks from property lines and buildings, distance to dikes, availability of outlets by gravity or pumping, and buried utilities. In selecting the location and design of a floodway careful consideration shall be given to the preservation of valuable fish and wildlife habitat and trees that are of significant value for wildlife food or shelter and to visual resources.

Access

All floodways must have access for maintenance. Typically, this may be along the side of the floodway or along the berm. The maintenance access needs to have adequate width for the maintenance equipment and inspection vehicles. For vehicles, the minimum width for one-way traffic should be 10 feet. Provide wider areas for passing and turning around at a regular distance. Access may need to be controlled to prevent vandalism, accidents, and damage.

Adverse Impacts

Environmental impacts from the proposed floodway will be evaluated and minimized. These may include, but is not limited to impacts to fisheries and wildlife habitat, the area's visual quality, structures, cropping fields, roads, or other items of significance.

Impacts due to potential changes in runoff, infiltration of runoff water into soil, percolation

below the root zone, amount of ground water recharge and the effects of soil moisture changes on vegetation or to land use in the vicinity of the floodway will be evaluated and minimized.

Other impacts to evaluate include the potential to reduce erosion and sedimentation; the effect of sedimentation on water quality, and sediment damage to flood plains, streambanks, and downstream channels.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

A site specific operation and maintenance plan shall be prepared and provided to the owner and/or operator of the facility that is consistent with the purpose of the practice, its intended life, safety requirements, and the criteria for design.

For Class I floodways, built in conjunction with dikes having a height greater than 12 feet, an emergency action plan meeting the requirements of §500.70 of the National Operation and Maintenance Manual shall be completed prior to construction of the floodway and dike. For Class I and Class II floodways, a detailed Operation and Maintenance Plan in accordance with §500.40 through §500.42 of the National Operation and Maintenance Manual shall be completed and provided to the owner.